

## CLAIMS

1. Method for mixing and distributing a gas and a liquid in a chamber comprising a distribution means constituted by a compartment that is filled with liquid through which a gas stream passes, whereby said method is characterized in that:

- Liquid is injected either in gas countercurrent or in gas co-current into the gas passage section or sections through at least two orifices that are present in said compartment, whereby said two orifices are arranged approximately facing one another, and
- The diameter and the number of orifices and/or the speed  $V$  of the liquid at the outlet of each of the orifices and/or the distance  $d$  between two injection points placed facing one another are selected such that the Froude number  $Fr$ , defined by the equation:

$$Fr = \frac{V}{\sqrt{g \times d}} \quad \text{in which } g \text{ is the gravitational constant,}$$

is more than 0.5.

2. Method according to claim 1, wherein the Froude number  $Fr$  is more than 1.
3. Method according to one of claims 1 or 2, wherein the distribution means consists of a compartment that is filled with liquid through which at least one passage section for the gas passes and in which the passage section or sections are pipes of essentially rectangular cross-sections.
4. Method according to one of claims 1 or 2, wherein the distribution means consists of a compartment that is filled with liquid through which at least one passage

section for the gas passes and in which the passage section or sections is or are shafts that are essentially circular cross-sections.

5. Method according to claim 4, wherein the diameter of the shaft is such that the speed of the liquid at the base of the shaft is less than  $0.35 \sqrt{g d_c}$ , where  $d_c$  is the mean diameter of a passage section, and  $g$  is the gravity field acceleration.

6. Method according to claim 4 or 5, wherein the number of injection orifices facing one another is between 2 and 5.

7. Method according to one of claims 1 or 2, wherein the distribution means consists of a liquid compartment encompassed in a continuous passage section of the gas in said chamber, whereby said compartment comprises a central portion and arms that are placed on both sides of said central portion and that extend toward the wall of the chamber, whereby orifices for injection of the liquid are provided on the walls so that an orifice has another identical orifice, opposite, placed on a contiguous arm.

8. Method according to any of the preceding claims in which the number of injection points of the liquid phase is encompassed between about 10 and about 1000 points per  $m^2$ .

9. Method according to any of the preceding claims, wherein the size of the orifices for injection of the liquid is encompassed between about 1 and about 20 mm.

10. Method according to any of the preceding claims, wherein the distance  $d$  between two orifices for injection of the liquid placed facing one another can be encompassed between about 10 mm and about 500 mm.

11. Method according to one of claims 1 to 10, wherein the distribution plate is placed in the chamber upstream from a bed of catalytic solid particles or from a packing

bed of the bulk, structured, foam, or monolithic type, in the direction of circulation of the liquid phase.

12. Application of the method according to one of the preceding claims to the treatment of an acid gas comprising at least one of the following compounds:  $\text{H}_2\text{S}$ ,  $\text{SO}_2$ ,  $\text{CO}_2$ , and  $\text{COS}$ .

13. Application of the method according to one of the preceding claims to the processes that use at least one liquid phase and at least one gaseous phase in at least one stage for separation, for purification or for chemical transformation.